TRANSFORMING THE ARMY BY MANAGING KNOWLEDGE

Jodi Santamaria and Emerson Keslar

Introduction

Knowledge management is playing a prominent role in the Army's transformation. This was best expressed in a memorandum signed by both the Secretary of the Army and the Army Chief of Staff in August 2001. In the memo, they stated, "Army Knowledge Management (AKM) is the Army strategy to transform itself into a network-centric, knowledge-based force." Prior to this memo, the Program Executive Office for Command, Control and Communications Systems (PEO, C3S) experimented with knowledge management methods and successfully applied them in its workplace.

This effort started in 1997 with a request from LTG Paul J. Kern, then Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (now with his fourth star and Commanding General, Army Materiel Command), and LTG William H. Campbell, then Director of Information Systems for Command, Control, Communications, and Computers (DISC4) (now retired). A PEO, C3S pilot program was chartered to demonstrate the positive outcome that could result when knowledge management techniques and principles are used within an organization and to provide a process for institutionalizing these concepts across the Army

acquisition community. In addition, the pilot program's team members were required to provide the PEO, C3S organization (including its headquarters, project manager suborganizations, Defense contractors, and supporting agencies) automated tools and business processes; a collaborative environment; and access to information required to plan, implement, and execute their critical missions despite their decentralized locations.

While the tactical Army digitized the Army's battlefield, the institutional arm of PEO, C3S embraced the opportunity to act likewise. As a result, the secure intranet/extranet PEO, C3S Knowledge Center was created to share information and collaborate on areas such as program planning, scheduling, budgeting, congressional briefings, maintaining configuration management, resolving interoperability issues among products, and developing new training and logistics strategies.

Since its inception, the knowledge center has met both of its chartered objectives and has extended beyond the borders of PEO, C3S as a consortium of functional business partners. Following a briefing to Army leaders and Office of the Secretary of Defense sponsors in spring 2001, the knowledge center team was asked to add members and initiate

another pilot program. This time, the plan was to establish the acquisition portal on Army Knowledge Online (AKO) in concert with AKM goals. The intent was to integrate the functional tools that a PEO community needs into an enterprise portal everyone will use.

Creative Imperatives

"Adapt or perish!" This timeless and prophetic phrase by Charles Darwin encourages us to remain relevant despite the constancy of change. This is a true challenge as the speed of technical advances rapidly increases and the slope of the curve describing Moore's Law grows steeper. (Moore's law is a prediction by Dr. Gordon E. Moore, Chairman Emeritus of Intel Corp., that the number of transistors per integrated circuit would double every 18 months.) Creative imperatives have always driven us to adjust to survive and, in this respect, times have not changed.

During the 1990s, the Army experienced significant workforce downsizing while the number of missions and responsibilities for Active duty soldiers increased. Knowledge management was seen as an enabler to transform the institutional Army into an information-age, networked organization that can leverage its intellectual capital to better organize,

train, and equip a strategic land-combat force. While the Army continues to transform, its personnel will need to undergo yet another cultural change to succeed in the newly created environment.

The collaborative tools used by industry are repackaged for use by project management offices (PMOs) while they develop acquisition requirement packages, conduct source selections, and communicate with their industry partners. Processes remain true to the regulations to ensure "repeatability," while the technical solutions are flexible enough to meet the needs and style of individual teams. Technologies that assist the self-aware and adaptive leaders in the field are now available in the business offices that support them. This permits us to "eat our own dog food," or better understand our users, and take advantage of technology insertion when possible. Formation of the acquisition portal and further integration with AKO presents this possibility.

Evolution Or Revolution?

When presenting a fair depiction of the situation, we must describe the barriers that were conquered as the knowledge center was developed and implemented—those ever-present cultural issues. Although it sounds sophomoric, people must learn to share. Any natural inclination not to disclose information was stamped out by staunch general-officer level leadership support, reinforced over a 3-year period. Slowly, the organization moved up the curve depicting the IBM Consulting Model. The IBM model is a KM model proposed by IBM's Consulting Group that describes eight different KM stages (including the critical enablers at each stage) that organizations must go through while transitioning from beginners to a knowledge enterprise.

Throughout the years, we have tried a number of incentive programs to reward and recognize our contributors. We feature their success stories and photos on our site and present awards whenever possible. Further, in September 2001, an even stronger motivator was established to ensure participation. In particular, the Program Executive Officer, C3S directed each of the PMOs to establish knowledge managers, responsible for managing useful, relevant, and current content. Simultaneously, he approved the ultimate incentive—knowledge contributions that affect individual performance appraisals. This novel concept will be enacted during the next rating cycle.

Charting The Knowledge Map

The first step is typically the hardest, but in this case, it was the second step. The challenge after quickly gaining the program executive officer's support was identifying, collecting, and organizing the information to be preserved. "Less" may not seem like "more." But by early focus on what sets the organization apart, we can harness the knowledge essential to survival in the future. This may seem straightforward, but it is anything but simple. And it is powerful advice, so take it. Years of gathering information left us with the daunting task of constantly maintaining and arranging it in a user-friendly, searchable format. We have adopted the AKO's search tool for uniformity within the Army enterprise. Our taxonomy has centered on the acquisition process and our programs. Still, there is work to be done. Focus energies on our core mission upfront, collect related knowledge, and learn from our predecessors to take courage and forego what is less important.

Where We Go From Here

Our immediate plans are to integrate with our PEO counterparts and the Army Research, Development and Acquisition Information Systems Activity to complete the acquisition portal within the AKO. This will avail our users of personalization and AKO Web mail in addition to the acquisition offerings. We are further enabling communities of practice through collaborative automation tools and e-learning on a local level. And, through an improved relationship with human resources personnel, we are identifying the assets that will be lost through retirement. This will allow us, via video archives, to capture the "tacit" knowledge embedded in their experience before they depart. Overall, we strive to impart knowledge that provides consequence and ensures successful missions with other members of the Army's knowledge enterprise. For more information, contact Emerson Keslar at **emerson-keslar@ us.army.mil** or Jodi Santamaria at **Jodi.Santamaria2@us.army.mil**.

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DISTRIBUTION-BASED LOGISTICS OPERATIONS

LTC Carl W. Hunt

Introduction

Information assurance (IA) and logistics operations permeate all areas of the Army transformation. IA is critical to distribution-based logistics operations because timelines and pipelines for delivery of logistics packages are increasingly constrained by environmental factors that are rarely under direct Army control. Short timelines are critical to the success of OCONUS military operations, but they clearly challenge operational planners more than ever. The convergence of emerging logistics and information technologies, in-transit visibility systems, new players, and advanced delivery capabilities reflect more complexity than Army logisticians have previously encountered.

The U.S. Army Criminal Investigation Command (CID) is responsible for enforcing three critical factors involved in distribution-based logistics operations: IA, fraud deterrence, and logistics security (LOGSEC). The CID provides law enforcement and criminal investigative support for information assurance and pre- and in-transit delivery of logistics packages, including preconfigured loads. In fact, LOGSEC is a strategic mission for the CID. The command considers it a key force protection capability that it can uniquely offer to the Army.

Although responsible for only three of the factors that add to the complexity of modern logistics operations, the CID is modeling its role and interfaces into the entire LOGSEC knowledge-management process, understanding that criminal investigative support is critical to logistics operations throughout the logistics process. This article examines some initial intersections of the CID's roles and research in IA, knowledge management, and logistics security.

Because of the complexity of the logistics system and its information support systems, and the countless threats to these systems, a new approach by criminal investigators is required. The CID is conducting preliminary research into new areas of modeling and simulation, known as agent-based modeling. This research involves studying the intersections of critical nodes and their linkages to produce insights for those responsible for the direction of logistics and IA operations.

Initially directed at the criminal investigation domain, the CID has initiated research into knowledge-management support for advanced network intrusion defense and forensics capabilities for IA. Supported by the Office of the Deputy Under Secretary of Defense for Advanced Systems and Concepts, the CID and the Krasnow Institute for Advanced Studies at George Mason University (GMU) are working jointly to model roles and actions of important players in the IA world.

Findings from this joint research will support logistics operations in at least two important ways. First, any improvement in IA will directly benefit LOGSEC and strengthen the role of the CID in supporting in-transit security of logistics packages. Second, in keeping with the extensibility of new agent-based modeling tools, insights gained from understanding networks of communication nodes will likely have significant application in logistics preparation and distribution. Research will be peripherally directed at the convergence of IA and LOGSEC, both in support of the CID's role in IA and LOGSEC as well as all logistics operations for the Army.

Agent-Based Modeling

Agent-Based Modeling (ABM) is an emerging modeling technology for enhancing inference about complex problems. ABM complements deduction and induction as a method of testing what American philosopher Charles S. Peirce called abductions (creative reasoning in uncertainty for which we have little or no probabilistic support). Abductive reasoning enhances the processes of discovery and incorporating theories and explanations about relationships for which we initially have only scant proof.

This new modeling technique encourages visualization of complex relationships and agent interaction. Agents are software manifestations of objects (animate or inanimate) used to represent the components of a problem domain. These agents are typically imbued with constraints (rules) to govern their behavior in an environment, and characteristics that may include movement, self-awareness, and processing capabilities such as learning and memory. Agents typically act on our behalf or sometimes on the behalf of themselves or others.

Using agent-based modeling, analysts and investigators can develop novel strategies for protecting and delivering both information-rich logistics support and the more conventional physical objects such as "beans and bullets." ABM supports transportation planning and operational deployment as well because complex scheduling problems lend themselves nicely to an agent-based modeling environment. (See agent-based modeling resources at **http://www.cna.org/isaac/** for